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CSCE 240: Advanced Programming Techniques
Lecture 25: Review for Quiz2

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12TH APRIL 2022

Carolinian Creed: "I will practice personal and academic integrity."

Credits: Some material reused with permission of Dr. Jeremy Lewis. Others used as cited with thanks.

Organization of Lecture 25

- Introduction Section
  - Recap of Lecture 24
  - News / announcements / clarifications
  - TA and SI Updates
- Main Section
  - Project – Guidelines on submission and presentation
  - Review of concepts
- Concluding Section
  - About next lecture – Lecture 26
  - Ask me anything

Introduction Section

Recap of Lecture 24

- Programming practice for project assignments based on PA#4
- We discussed
  - Templates
  - Class templates
  - Functional templates

Announcement

- McNair Junior Fellows program: **30 grantees** this summer, and we sure hope you can encourage your students to explore this opportunity. All details and applications are on: http://www.cec.sc.edu/mjf | **Deadline April 8th, 2022!**
  - The program, in its 8th year since its foundation, and in its 4th year as an official CEC program, provides supports for undergraduate students up to 3k$ in summer funds and runs activities that helps the students further explore research (as well as research posters, state of the art and other research initiation programs).
  - Contact: Ramy Harik
- Summer Internships at AI Institute
  - You can work with faculty and get paid
  - You can apply to fellowship as well as work with faculty (with/ without pay)
  - You can work on your idea with a faculty to mentor (with/ without fellowship)

Updates from TA, SU

- TA update: Yuxiang Sun (Cherry)
- SI update: Blake Seekings

Main Section

Discussion: Course Project

Course Project – Assembling of Prog. Assignments

- **Project**: Develop collaborative assistants (chatbots) that offer innovative and ethical solutions to real-world problems ! *(Based on competition - https://sites.google.com/view/casy-2-0-track1/contest)*
- Specifically, **the project will be building a chatbot that can answer questions about a South Carolina member of state legislature from**: https://www.scstatehouse.gov/member.php?chamber=H
  - Each student will choose a district (from 122 available).
  - Programming assignment programs will: (1) extract data from the district, (2) process it, (3) make content available in a command-line interface, (4) handle any user query and (5) report on interaction statistics.

Core Programs Needed for Project

- Prog 1: extract data from the district **[prog1-extractor]**
- Prog 2: process it (extracted data) based on questions **[prog2processor]**
- Prog 3: make content available in a command-line interface **[prog3-ui]**
- Prog 4: handle any user query **[prog4-userintent2querymapper]**
- Prog 5: report statistics on interaction of a session, across sessions **[prog5-sessionlogger]**

- Full Chatbot - Prog 6: **[myrep-chatbot]**

Prog 6: Assembling the Chatbot

- Have a program - **[myrep-chatbot]**
- User interacts with the chatbot with any utterance and the system has to answer – see right
- User can ask about statistics and query log
  - Same as PA5
  - See next slide

[#1] "Quit" or "quit" or just "q" => Program exits
[#2]"Tell me about the representative", "Tell me about the rep" => Personal Information (Type-I2)
[#3]"Where does the rep live" => Contact Information (Type-I1): Home Address
[#4]"How do I contact my rep " => Contact Information (Type-I1)
[#5]"What committees is my repo on" => Committee Assignments (Type-I3)
[#6]"Tell me everything" => Give all information Extracted
[#7] "What district do you support for Q/A" => Give district number and name
[#8] *<User can enter any other text and the program has to handle it>* => "I do not know this information" or
"Here is my guess - " + <query> + <answer>. "Did I answer correctly ? "

All Queries to be Supported

[#1] "Quit" or "quit" or just "q" => Program exits
[#2]"Tell me about the representative", "Tell me about the rep" => Personal Information (Type-I2)
[#3]"Where does the rep live" => Contact Information (Type-I1): Home Address
[#4]"How do I contact my rep " => Contact Information (Type-I1)
[#5]"What committees is my repo on" => Committee Assignments (Type-I3)
[#6]"Tell me everything" => Give all information Extracted
[#7] "What district do you support for Q/A" => Give district number and name
[#8] *<User can enter any other text and the program has to handle it>* => "I do not know this information" or
"Here is my guess - " + <query> + <answer>. "Did I answer correctly ? "

myrep-chatbot –summary
=> There are 12 chats to date with user asking 23 times and system respond 24 times. Total duration is 456 seconds.

- **myrep-chatbot** –showchat-summary 2

=> Chat 2 has user asking 2 times and system respond 2 times. Total duration is 4 seconds.

- **myrep-chatbot** –showchat 2

=> Chat 2 chat is:
…

- **myrep-chatbot** –showchat 200

=> ERROR: there are only 12 chat sessions. Please choose a valid number.

Project – PA#6

- Code organization
  - Create a folder in your GitHub called "**myrep-chatbot**"
  - Have sub-folders: src (or code), data, doc, test
  - Have data directory as shown in previous slide
    - ./data/**chat_sessions/**
    - ./data/ **chat_statistics.csv**
  - Create/ write a
    - Video in ./doc sub-folder demonstrating the working of chatbot
    - Report in ./doc sub-folder. Credit reuse
    - Create a presentation in ./doc sub-folder
  - Put a log of system interacting in ./test
  - Send a confirmation that code is done by updating Google sheet; optionally, send email to instructor and TA

- Use concepts learned in class
  - Exceptions
  - File operations
  - PA1 to PA5 from yourself or others; credit reuse in Readme, report and presentation

Submission Guidelines and Deadlines

- The breakup of marks (100) will be as follows –
  - 20 points for the fully working demo, due by Tuesday, April 12, 2022. Submit code and video.
  - 40 points for report, due by Friday, April 15. Submit report in format.
  - 40 points for the presentation, due by Tuesday, April 19.
  - There will be no further submissions.
- To show working demo - due by Tuesday, April 12, 2022
  - Submit code to your github and update PA spreadsheet
  - Submit a video of the chatbot running and answering all 12 questions

Format for Project Report –
Due by Friday, April 15, 2022

- Requirement – What did the instructor ask you to do?
- Specification – What did you you do, what scope you selected and what decisions you made?
- Development highlights – How was your code implemented, e.g., module design, classes ? How did you test ? What problems did you face and how did you solve them?
- Reuse – What did you do to make your code reusable? Whose code did you use and why? Who is using your code and why ? What challenges did you face?
- Future work - What more can be done to make your chatbot useful? How will the code need to be changed over time?

Project Presenter Name:
Student Name:

Scope: District, Prog. Language

Data: What data is available and what is retrieved from program ?

Code Organization: Anything significant to highlight ?

PA1:
PA2:
...
PA6: code reuse by someone, and of someone

Queries Snapshot

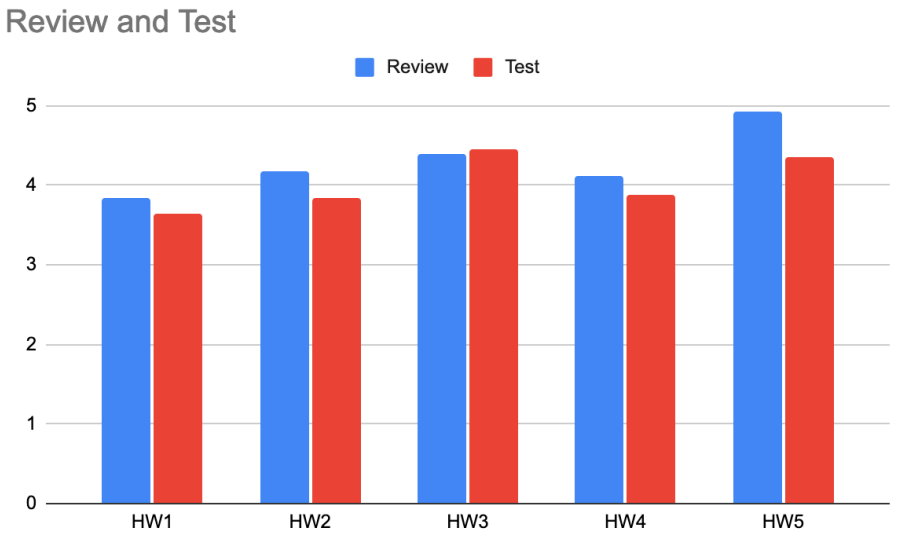
Video link:

Experience implementing the chatbot, Testing

Review of Main Concepts

Improvement Due to In-Class HW Reviews

- HA1 to HW5, all in C++
- At least 1 point improvement
  - Peer review (3.83 -> 4.92; 28.3% improvement)
  - Peer test (3.64 -> 4.35; 19.4% improvement)
- Min participation: 32



Assignments: Late Submission Policy and Extra Marks

- There is **no provision for late submission** for programming assignments
  - Except when prior approval has been taken from instructor due to health reasons

- One can possibly make more marks when doing final project assembly
  - **Remember**: PA1, PA2, PA3, PA4, PA5 will be the 5 programs from assignments. [100 points for each assignment]
  - **Remember**: Assembling code from one's on assignments gets the standard [100 points].
  - Extra points will be given if you make your code (for PA1 – PA5) available to others (make repository public) AND someone uses your code (any of PA1-PA5). Both will have to be reported in project report.
    - **40 points will be given per assignment to student whose assignment is reused**, and
    - **20 points will be given to person who reuses code**
  - Extra points will not exceed 100 points for any student. That is, one cannot make more than 700 points.

Review of Topics

1	**Jan 11 (Tu)**	**Introduction**	
2	Jan 13 (Th)	Introduction – Pointers, Iteration	
3	Jan 18 (Tu)	Input/ Output	
4	Jan 20 (Th)	I/O, Exceptions	HW 1 due
5	Jan 25 (Tu)	Memory management, User defined types	Prog 1 - start
6	Jan 27 (Th)	Object Oriented (OO) intro	HW 2 due
7	Feb 1 (Tu)	OO concepts, UML Notations	
8	Feb 3 (Th)	Code org (C++)	Prog 1 - end
9	Feb 8 (Tu)	OO – inheritance	Prog 2 - start
10	Feb 10 (Th)	Regex, OO - polymorphism	HW 3 due
11	Feb 15 (Tu)	In class test	Quiz 1 – In class
12	**Feb 17 (Th)**	**Review: inheritance, Polymorphism**	
13	Feb 22 (Tu)	Exceptions	Prog 2 - end
14	Feb 24 (Th)	OO – Constructor, Destructor	Prog 3 - start
15	Mar 1 (Tu)	OO – operators, access control	HW 4 due
16	Mar 3 (Th)	C++ standard library	Prog 3 - end Semester - Midpoint
17	Mar 15 (Tu)	Testing strategies	Prog 4 - start
18	Mar 17 (Th)	Advanced: Pointers	HW 5 due
19	Mar 22 (Tu)	Advanced: Pointers, I/O	
20	Mar 24 (Th)	Advanced: Operator overloading	Prog 4 - end
21	Mar 29 (Tu)	Advanced: Memory Management	Prog 5 - start
22	Mar 31 (Th)	Advanced: Code efficiency	
23	Apr 5 (Tu)	Advanced: Templates	Prog 5 - end
24	Apr 7 (Th)	AI / ML and Programming	Prog 6 - assembling

Concluding Section

Lecture 25: Concluding Comments

- Project
  - 20 points for the fully working demo, due by Tuesday, April 12, 2022. Submit code and video.
  - 40 points for report, due by Friday, April 15. Submit report in format.
  - 40 points for the presentation, due by Tuesday, April 19.
- Review for Quiz 2

About Next Lecture – Lecture 26

Lecture 25: Quiz 2

- All concepts taught in class
- No online giving option

25	**Apr 12 (Tu)**	**Review material for Quiz 2**	**Project due**
26	Apr 14 (Th)	In class test	Quiz 2 – In class
27	Apr 19 (Tu)	Project presentation	
28	Apr 21 (Th)	Project presentation	Last day of class
29	Apr 28 (Th)	Wrap-up and Conclusion	Examination